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“WHY DO YOU MAKE THINGS?” QUESTION PROMPTS AS A TOOL TO
SUPPORT MINDFUL MAKING IN LIBRARY MAKER SPACES (Paper/Poster)

Abstract: The paper investigates how question prompts might help young people think creatively, critically, metacognitively, and with a sense of social responsibility vis à vis their relationship with the technologies and media that they create in library maker spaces.

Résumé:

1. Introduction

A new service model is emerging in the world of public libraries - the maker space. This is a physical place akin to a laboratory where informal, collaborative learning can happen through hands-on creation that generally targets science, technology, engineering, and mathematics (STEM) competencies and the industrial arts. This paper investigates how question prompts might help young people think creatively, critically, metacognitively, and with a sense of social responsibility vis à vis their relationship with the technologies and media that they create in library maker spaces. In short, the paper asks how the dialogic affordances of the library might help young people to become *mindful makers*?

2. Mindful Making and Critical Technical Practice

Mindful making is associated with critical technical practice, a process-oriented perspective on “making” that incorporates reflection and reflexivity in the design, development, and use of technological artefacts, with the broader goal being to develop positive technologies that speak to an authentic and rich human experience (Boehner, David, Kaye, & Sengers, 2005). Various approaches to critical technical practice have emerged, such as *value sensitive design* (Friedman, 1996), *values-in-design* (Knobel & Bowker, 2011), *reflective design* (Sengers, Boehner, David, & Kaye, 2005), *critical computing practice* (Floyd, 2005), and *critical making*, which invites reflection on the non-digital built environment as well (Ratto, 2011; Ratto & Boler, 2014).

The key to developing a critical technical practice is “authenticity, making our own values explicit, respecting those of others and reflecting so as to find common steps that we can take” (Floyd, 2005, p. 211). One way to reveal values is through the actions of reflection and self-critique, both of which can be prompted through the questions that we ask ourselves about the technological artefacts we make. A simple, straightforward technique for scaffolding reflection and self-critique, therefore, might be the humble question prompt, a socio-cultural tool that is particularly well suited to unstructured, informal learning environments such as library maker spaces. As many teachers know, skillful questioning from a knowledgeable other (in the case of the library maker space, a mentor) can help learners analyze their own thinking processes, see connections, build new understanding, and support a disposition toward mindful and critical technical practices. With practice and modeling, learners may ask these questions of themselves, without the direct intervention of an expert.

3. Study Background

This paper presents preliminary results from Phase 2 in the *Mindful Making* project, a series of studies that are examining the application of Socratic questioning techniques and their role in scaffolding critical thinking around the creation and construction of digital technologies in maker spaces for youth. Phase 2 builds upon earlier fieldwork and qualitative analysis exploring the actual question prompts used in maker spaces for youth, by both young people and the adults who work with them. This earlier work resulted in a set of eight activation questions that can offer a meaningful pathway toward critical technical practice (not as a strict guideline but rather, as a tool that might trigger thinking and generate other questions). The questions are grounded in the authentic practices of teens and can thus serve as a realistic and practical tool for scaffolding mindful and critical practices in library maker spaces for youth. (Please see Bowler & Champagne, 2016 for more background on the study and details about Phase 1). The eight activation questions are presented in Table 2 below.

[Insert Table 2 here]

4. Methods

Phase 2 of the study, reported in this paper, took the “Mindful Maker” question prompts back into the field and explored how the questions are experienced by library staff (mentors) and teens vis à vis critical technical practice. The study took place during Spring 2016, over the course of eight weeks, at a teen maker space in a Pittsburgh-area public library. The maker space offered youth, ages 11 to 17 years, a mix of unstructured, technology-based, “maker” activities (such as learning how to code with the visual programming language *Scratch* or to design and print objects with *Tinkercad*, the 3D modeling software for young people). Many teens simply “hung out”, using the laptops available in the space to play games, check-up on social media, or complete their homework.

Data gathering methods in this study included participant observation (Nine after-school sessions, including one which was designed and facilitated by a researcher), a focus group with seven teens, and three interviews (one with the adult “mentor” and two with teens). All instruments were framed around the experience of using the eight question prompts that were identified in Phase 1 of the *Mindful Making* project.

Initially the question prompts were simply inserted into interactions with teens, without explicitly referring to a list of questions. The adult mentor was asked to try and deliberately seed his conversation with some of the questions (where applicable) and to think of ways to design a project that might incorporate question prompts. Midway through data collection, an activity incorporating the question prompts was designed and then implemented with teens. At the end of data collection, the question prompts and concepts related to critical technical practice were explored more deeply with the adult mentor and the teens, in a series of interviews and a focus group.

5. Preliminary Findings

A preliminary review of the data reveals that using the question prompts in the maker activities at the library was both a burden and inspiration to the adult mentor and the teens. As the mentor expressed it:

“Sometimes the experience was one of...shoehorning a question in where I might not have otherwise...But...in the best case scenarios, though, I would look over at the questions and it would prompt me to think about something I hadn’t thought of before.” (*Maker space mentor*)

While the eight activation questions did help to prompt self-critique and critical awareness of technology, both the adult mentor and the teens felt that the questions had to arise naturally, in the context of the activity, and were much dependent on the relationship between mentor and maker and the activity of the moment. This suggestion confirmed the original assumption of the researcher that question prompts might be a helpful tool to trigger thought processes but should not be a rigid and prescriptive guideline to use in a formulaic manner.

Sometimes the adult mentors interpreted the question prompts differently than did the young people. For example, the adult mentor thought the question “Can I let myself make a mistake?” was a threat to teens because it would raise the specter of failure. This echoes the thoughts of the mentors interviewed in the Phase 1 study, who felt that teens viewed mistakes (for example, writing code that didn’t work) not as an opportunity for growth but rather, as evidence of failure. But one young person (male, aged 11) explained that he is always open to making mistakes, describing how he learned to cook spaghetti through trial and error. In the focus group, another teen (female, aged 14) said that, yes, it was good to ask someone if they are open to making a mistake because she herself had “recently just learned that it’s okay to make mistakes and everything... yeah” – the assumption here being that some teens don’t know it’s ok to make a mistake. So while the adult mentor in this study was somewhat leery of talk about “mistakes”, based on his experience working directly with teens, the teens were not. This difference in perception raises the question as to the level of self-awareness that teens have with regard to their actual technical practices and possibly the need to pursue the issues of persistence and iterative design.

Interestingly, the very act of asking teens and the mentor about the meaning of the question prompts and the experience of using them seemed to raise an awareness of critical technical practice, leading the mentor to suggest that an interesting activity might be to simply sit around a table “with a bag of chips” and use the question prompts to frame a loose conversation about “Why do you make things, why do you wanna make things? Will it make you happy?” It seems that one affordance of the eight question prompts might be to enable “hanging out” which, according to the *Connected Learning* model (Ito et al., 2013) is a great facilitator of deeply engaged, socially supported, out-of-school learning.

Asking about the question prompts also provided an opportunity to explore broader themes related to learning in libraries. Results point to the need for a deeper understanding about the principles and pedagogy of informal learning. The adult mentor found it paradoxical that to make the questions seem more natural, “they’d require more planning” - an approach he had yet to incorporate into his practice. For librarians working with youth, placing more structure into a place that is supposed to be driven by the interests and motivation of its users is often seen as a negative, as counter to the very goals of the public library. But as teachers learn in their training (but many librarians do not), learning experiences designed with intentionality do not necessarily lead to a rigid, boring approach. Understanding critical pedagogy, constructivist and constructionist learning theory, and learner-centered techniques may help librarians who serve as mentors in library maker spaces aim for broader outcomes like critical technical practice. More specifically, training in how to ask guiding questions in the social context of the maker space will help teen librarians in their work to support the positive development of young people.

6. Conclusion

The purpose of this study was to explore how the dialogic affordances of the library – specifically, the question prompt – might help young people become mindful makers. That is, people who think critically about themselves as makers and the technological artefacts that they construct. The study found that the intentional use of questions in library maker spaces to help scaffold critical thinking about technological practices can prompt new thinking about the making experience. The study also found that library staff need training in techniques associated with dialogic reasoning.

The red thread that weaves its way throughout this paper is the central role of interpersonal communication, conversation, and person-to-person relationships in Library and Information Science. Question prompts, as a dialogic technique designed to support deeper thinking about the human relationship with technology, are one means to support the sociability of the information space that we call “the library”.

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Tables:

Table 1: Eight activation questions for Mindful Makers.
<ul style="list-style-type: none">• What will make me happy?• Who is my audience?• What resources do I have and need?

- What will inspire me to give my time and effort to a project?
- What do I know?
- Can I let myself make a mistake?
- How will my creation affect other people?
- What kind of maker am I?